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SOWERBY'S WHALE ON THE AMERICAN COAST

GLOVER M. ALLEN

A CENTURY has now elapsed since Sowerby's whale (*Mesoplodon bidens*) was first made known to science by James Sowerby ('04) in his *British Miscellany*. During this period barely more than two dozen additional specimens have been recorded and these have more often been to a greater or less extent imperfect. Flower ('72) in his account of the genus, listed but ten specimens of this species known by him to be at that time preserved in the museums of the world. Seven of these ten specimens were represented by skulls only, while of the three others more or less of the skeleton was saved. Turner ('89) gave the number of known records for the occurrence of this whale as nineteen, and a few more specimens have since been made known, so that the general characters of the species are now fairly well ascertained.

At the time of Turner's writing (1889) but two examples of *Mesoplodon* had been recorded from the western side of the North Atlantic. The first of these was stranded on Nantucket Island, Massachusetts, in 1867 (Agassiz, '68), and its length is recorded as 16 feet, 3 inches (J. A. Allen, '69, p. 205). The second American specimen was captured on March 28, 1889, at Atlantic City, New Jersey, and was secured by Dr. F. W. True for the United States National Museum (Turner, '89, p. 13). Nothing further was known of the species in American waters until 1898, when a young female was found dead on the coast at Annisquam, Massachusetts, in August. Its skeleton was obtained by the late Professor Alpheus Hyatt for the museum of the Boston Society of Natural History. Save for a brief mention (Hyatt, '99) this specimen has not been reported upon.

I am indebted to Mr. Thomas Barbour, of New York City, for the privilege of recording a fourth American specimen and the twenty-sixth hitherto known. Mr. Barbour has very kindly written out the following notes respecting this interesting capture.

"On the 22d of July, 1905, a large specimen of *Mesoplodon*

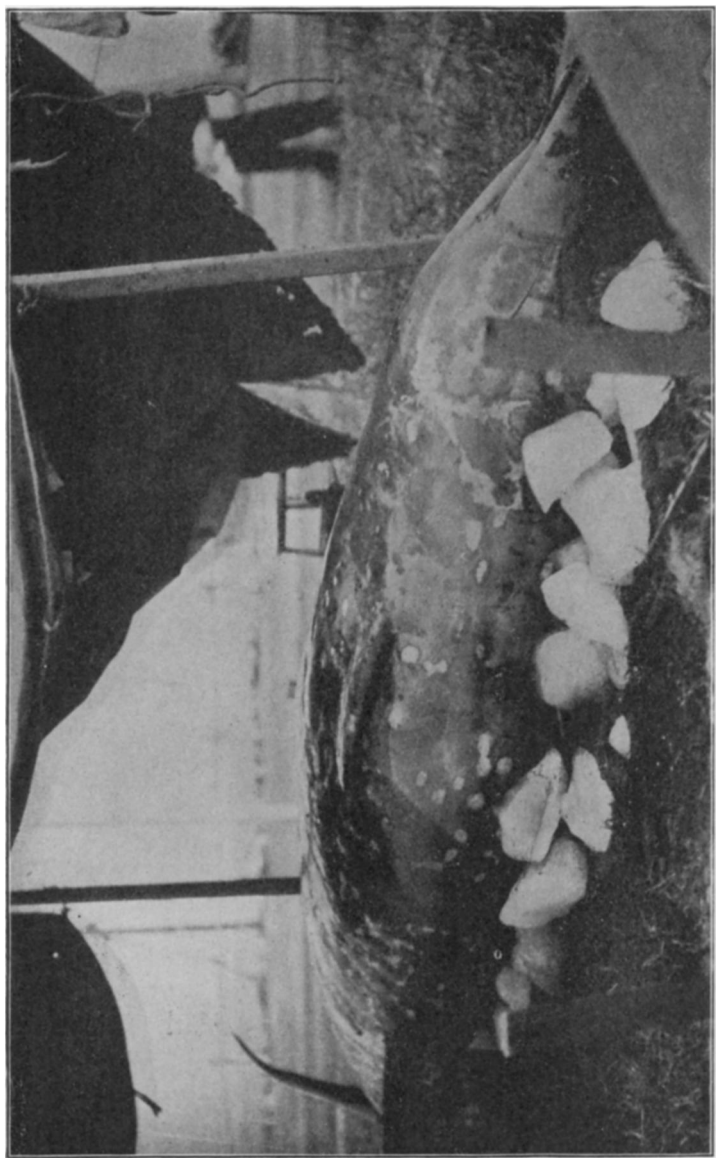


FIG. 1.—*Mesoplodon bidens*; North Long Branch, New Jersey. Ventral view. From photograph loaned by Mr. Thomas Barbour.

bidens became entangled in the pound-nets about a mile offshore from North Long Branch, New Jersey. It was rather exhausted when found, and was towed with some difficulty by two large power pound-boats to the beach, where it was secured by a rope. It soon died owing to injuries received during its capture.

"The total length of the specimen was said by the fishermen who measured it, to have been 22 feet. The coloration was very peculiar. The entire upper surfaces were slaty blue-black, the lower surfaces somewhat lighter. The sides and belly were dotted with numerous white spots, each varying from one to three or four inches in diameter. On the throat these patches became more or less confluent and very irregular in outline."

With some difficulty, Mr. Barbour succeeded in having photographs of this animal taken, two of which are here reproduced. The first of these (Fig. 1) shows the whale lying on its left side with the ventral portion toward the observer. The spindle-shaped form of the body, the small pectoral limb, and the beak-like snout are fairly well seen. As the anterior part of the animal's body was shaded by a canvas awning, the light spots and irregular throat-markings are distinctly seen in the photograph without the addition of light areas due to reflection, such as sometimes appear in photographs of parts taken in direct sunlight. The two diverging gular sulci are very well shown at the right-hand end of the figure, and are clearly not confluent at their anterior inception. One of these sulci (the lower in the figure) seems to be open, as though stretched apart by the dragging of the left side of the head. Fig. 2 is a view of the top and right-hand side of the head. The single crescentic blowhole with its extremities directed forward, is seen at *a*; what appears to be the right eye is seen at *b*. The very small mandibular tooth (*c*) is seen barely projecting from the gums and its small size indicates that the animal was probably a female. The lower jaw is clearly longer and broader than the upper, and a slight groove or gutter can be made out at the corner of the mouth.

The skull of this specimen was secured at considerable trouble by Mr. Barbour, and presented by him to the Museum of Comparative Zoölogy where it is catalogued as no. 7301. The mandibles and the rostral portion, however, were subsequently destroyed by an unfortunate accident.

It will be of interest to bring together a few notes on the Anni-squam and the Long Branch specimens for comparison with other recorded observations on this species.

A considerable variation in the color seems apparent from the accounts of various authors, especially in respect to that of the



FIG. 2.—*Mesoplodon bidens*; North Long Branch, New Jersey. Top of head. *a*, blow-hole; *b*, right eye; *c*, tooth. From photograph loaned by Mr. Thomas Barbour.

under parts. Turner ('89) summarizes briefly the descriptions given up to that time and concludes that there "can be no doubt . . . that this animal is not of the deep black colour on the dorsum which one sees in *Hyperoodon*, but that the dark hue is dashed with a bluish tint, so that one may describe the prevailing colour of the back as dark bluish-gray or bluish-slate colour. The grey or whitish, almost circular spots . . . are obviously also characteristic markings of the skin. The belly is not white but of various shades of grey, dashed perhaps with a bluish tint." Southwell and Harmer ('93), however, describe the female stranded at Norfolk, England, Dec. 18, 1892, as of a uniform black color, "not appreciably lighter on the belly than on the back," with a "perceptible bluish tint on the skin in a good light." They note also

the light streaks and blotches "most numerous on the side and ventral surface." The large fetus contained in this specimen was a male and had the under parts "white." W. Rothschild ('93) accordingly suggests that it may prove in this species that the males have the belly white, while the females have this region of much the same color as the back and sides, save for the light blotches already mentioned. The Long Branch female seems to be of this latter type of coloration. Grieg ('98) found that the male taken at Karmö was colored much as Rothschild describes, with the back a blue-gray becoming lighter on the belly, which was nowhere *pure* white but tinged with reddish. The clear color of the belly extended from the gular folds to the genital opening, and there were none of the roundish circular spots to be discovered. Evidently the coloration was much like that of the Havre specimen figured by Dumortier ('39). Most of the recorded specimens, however, have not been examined while in a fresh condition by a trained naturalist and the few descriptions of the external coloration are insufficient to settle the question of a sexual dimorphism in this respect.

Regarding the Annisquam specimen, no color notes were taken, but from a few small photographs in the possession of the Boston Society of Natural History, it appears evident that the ventral portion was of a lighter tint, and in one of the views a few oval whitish spots are seen on the side a trifle behind the middle portion of the body. Another view shows the convexity of the posterior margin of the flukes at the median point as well as the prominent dorsal fin. The lower jaw protruded slightly beyond the upper. Measurements of this specimen, as noted by Professor Hyatt, are as follows: total length, 12 feet, 2 inches; from anus to bight of flukes, 3 feet, 4 to 6 inches; across the flukes, 3 feet, 1 inch; from tip of rostrum to angle of mouth, 1 foot, $1\frac{1}{2}$ inches. The gular furrows were noted as about 10 inches long and from $\frac{1}{4}$ to $\frac{1}{2}$ an inch deep.

The bones of the Annisquam specimen were macerated and cleaned, and are now preserved in the collection of the Boston Society of Natural History. The skeleton presents several points of considerable interest and through the kindness of Mr. Charles W. Johnson, the curator of the Society's museum, I have been enabled to make the following notes.

The skull shows the specimen to have been rather immature as

the sutures are largely unclosed; moreover, the rostral cartilage had not ossified so that the thin overarching premaxillæ of the rostrum form a long tube nearly closed dorsally except for a slight space where these bones do not quite meet along the median line. The proximal portions of the premaxillæ just anterior to a line passing across the middle of the blowhole, are nearly flat; they then rise almost perpendicularly to the vertex of the skull and seem to overhang the blowholes but slightly, although this relation is somewhat obscured owing to a slight injury. The maxillary bones *slope downward* from their junction with the premaxillæ to the rim of the cranium. In the Long Branch cranium, which is that of an animal fully adult, the broad proximal portions of the premaxillæ are slightly hollowed in front of the nares, and rising to the summit of the skull, overhang the blowhole by their greatly thickened antero-dorsal edges. In front and at the sides of the nares the maxillaries *are elevated* as much as 2.5 cm. above the adjacent premaxillaries, so that True's ('85, p. 586) statement in regard to *Ziphius* and *Hyperoödon* holds good also in some degree for *Mesoplodon*, namely, that "there appears to be a progressive excavation or absorption of the bones lying in the median line of the upper surface of the beak, accompanied by introversion of the premaxillæ and a rounding off of the extremity of the beak."

In both the *Annisquam* and the Long Branch skulls the right premaxillary is slightly larger than the left and the right nasal opening is more convex in its exterior outline than the left. In both specimens the maxillary and the premaxillary foramina are on practically the same line with relation to the transverse axis of the skull, though in the Long Branch specimen the former is about 1 cm. behind the latter. In the *Annisquam* specimen the maxillary foramen is very large and its opening is below the level of the surrounding parts. It is continued forward as a deep groove or canal to the base of the rostrum, which is a feature practically lacking in the skull from Long Branch. In each ramus of the lower jaw there is a single tooth situated 25 cm. from the tip, or 3 cm. anterior to the middle point. From measurements given by Grieg ('98) for the two *Karmö* specimens the large tooth was situated at one third the jaw length from the tip in each. In the *Cap Breton* specimen, according to Fischer ('92) the tooth was three

sevenths of the jaw length from the tip, just back of the symphysis. The teeth of the Annisquam specimen barely projected above the alveoli of the jaws and are sharply mucronate. The basal portion of each, however, is more like that of the male's tooth in the slightly convex posterior outline and the forward extension of the anterior angle. Fig. 3 represents a lateral view of the tooth from the right mandible of the Annisquam whale; its extreme length from the point to the anterior tip is 55 cm.

The Annisquam skeleton has 45 vertebræ. Four of the seven cervicals are fused. The atlas, axis, and third cervical are firmly ankylosed throughout, save for the lateral foramina for the passage of the cervical nerves. The fourth cervical is fused to the third by the dorsal spine on the left side and by the tip of the upper lateral process of the same side. Its centrum, right half of the dorsal spine (the spine is divided medially), and the remaining lateral processes are free. This is the only case thus far recorded in which four cervicals have been found fused in this species for Reche's (:05, p. 171) statement that Flower has recorded a specimen the dorsal spine of whose fourth cervical was fused

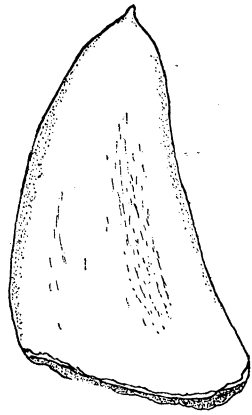


FIG. 3.— Lateral view of mandibular tooth of *Mesoplodon bidens*, female, Annisquam specimen. Natural size.

to the third, is a *lapsus*. Flower is here referring to *Ziphius cavirostris*. Grieg ('98) found that the first five cervicals were united in one of the Karmö specimens but the first two only in the other example and the same author (:04) found the first three fused in the Rugsund specimen (1901). Fischer ('92) records that in the Cap Breton whale the first two were entirely ankylosed while the centrum but not the spine of the third was fused with the second cervical. Aurivillius ('86) accredits the Bohuslän (1885) specimen with three fused cervicals. Turner ('85) found the first two only fused in the two Shetland examples and the same was true of these bones in the Skager Rack and the Vanholmen specimens (A. W. Malm, '71; A. H. Malm, '85). Van Beneden and Gervais in their *Ostéographie des Cétacés* give the number of

fused cervicals as three while both Van Beneden ('64) and Dumortier ('39) agree in stating that the first two only were fused in the Ostend 1835 example. The fusion of the first two is thus apparently the more usual condition. In the Annisquam whale the epiphyses of the fourth and fifth cervical vertebræ and the anterior epiphysis of the sixth cervical are fused to their respective centra, but all the other epiphyses of the vertebral column and of the pectoral limbs are free.

The Annisquam skeleton has nine dorsal vertebræ with their corresponding pairs of ribs, a number which agrees with that of at least four recorded skeletons though ten pairs of ribs are recorded in case of five others (Rugsund, 1901; Karmö, 1895; Shetland, 1885; Skager Rack, 1869; Ostend, 1835).

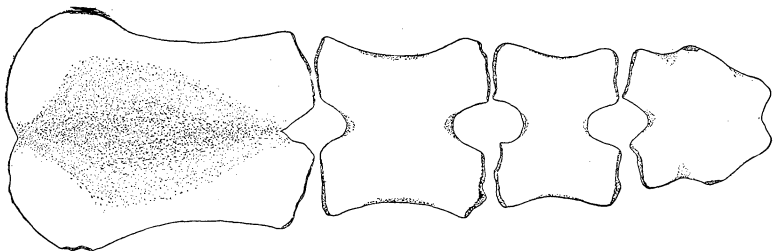


FIG. 4.—Sternum of *Mesoplodon bidens*, female, from above; Annisquam specimen.

The sternum of this specimen presents a few points of interest. It consists of four pieces, the anteriormost of which is largest, slightly hollowed above, and correspondingly convex below. The three remaining pieces are nearly flat, with a deep median notch at the anterior and posterior border of each. The most posterior piece evidently represents a fusion of the elements of two segments as there are articular surfaces for two pairs of ribs. Both the Karmö specimens (Grieg, '98) had sterna of four pieces and in each the fourth or most posterior piece seems to show articulating surfaces for two pairs of ribs. Apparently in these the very small sternal elements of each side corresponding to the fifth pair of ribs fused with the next anterior sternal segment but did not fuse medially with each other, so that a deep notch is left in the posterior margin of the last sternal piece. In the male Karmö specimen the notch is nearly closed posteriorly indicating a medial approxi-

mation of the elements of right and left sides, and thus approaches the condition described by Fischer ('92) for the Cap Breton specimen whose sternum was likewise of four pieces. The fourth was notched in front and had a central hole and a posterior notch. This central hole evidently corresponds to the two notches that would have been formed between the fourth and fifth sternal elements had they failed to fuse with each other. In the Annisquam specimen this space has been quite obliterated. According to A. W. Malm ('85) the sternum of the Skager Rack whale consisted of five pieces of which the two posterior were ankylosed, while that of the Vanholmen specimen was of four segments. Aurivillius ('86) states that the sternum of the Bohuslän skeleton was of four pieces of which the last is practically like the others save that the posterior notch is nearly closed. The sternum of the Rugsund specimen as figured by Grieg (:04, p. 33) is likewise of four segments, but the two elements of the fourth segment have not united medially while that of the left side is ossified with the next anterior piece. The 1885 Shetland whale had five sternal pieces (Turner, '85) but the 1881 Shetland example had four sternal pieces only, the posteriormost of which, as in the Annisquam skeleton, represented a fusion of the fourth and fifth pairs of elements (Turner, '82). Still another variation is seen in the Ostend specimen in which the two elements composing the fifth or posteriormost piece are separate both from the piece next anterior and from each other, while that of the left side is apparently displaced so as to be in advance of the corresponding element of the right side (Van Beneden, '64, pl. 3, fig. 2). An additional point of interest in the Annisquam sternum is its bilateral asymmetry for the right-hand element of each of the four pieces is slightly longer than that of the left side (Fig. 4). Thus the extreme lengths of the right-hand elements in centimeters are: 15.1; 8.4; 6.0, and 7.1, while those of the left-hand elements are 14.7, 7.9, 5.85, and 6.8 respectively. A like asymmetry is seen in Grieg's figure of the Rugsund specimen.

For convenience of reference, the known recorded specimens of Sowerby's whale are listed in the following table: —

Recorded Specimens of Mesoplodon bidens

No.	Sex	Locality	Date	Reference
1	male	Elginshire, Scotland	1800	Sowerby, '04
2	female	Havre, France	Sept. 9, 1825	Blainville, '25
3	male	Sallenelles, France	Summer, 1825	Deslongchamps, '66
4	female	Ostend, France	Aug. 21, 1835	Dumortier, '39
5	male	Brandon Bay, Ireland	Mar. 9, 1864	Andrews, '69
6 ¹	male	Norway	before 1866	Van Beneden, '66
7	—	Nantucket, Mass.	1867	Agassiz, '68
8	male	Skager Rack	June 15, 1869	A. W. Malm, '71
9	male	Brandon Bay, Ireland	May 31, 1870	Andrews, '70
10	female	?Scotland	1872	Turner, '72; Flower, '72
11	female	Hevringholm Strand, Denmark	Feb. 3, 1880	Reinhardt, '80-'81
12	male	Shetland	Apr., 1881	Turner, '82
13	male	Vanholmen, Sweden	Oct. 30, 1881	A. H. Malm, '81, '85
14	male	Shetland	May 23, 1885	Turner, '85
15	male	Bohuslän, Sweden	Aug. 6, 1885	Aurivillius, '86
16	male	Yorkshire, England	Sept. 11, 1885	Southwell and Clarke, '86
17	male	Firth of Forth, Scot- land	Oct., 1888	Turner, '89
18 ²	—	—	before 1888	Van Beneden, '88
19 ³	female	Norfolk, England	Dec. 18, 1892	Southwell and Har- mer, '93
20	male	Cap Breton, France	Aug., 1888	Fischer, '92
21	female	Atlantic City, N. J.	Mar. 28, 1889	Turner, '89
22	female	Karmö, Norway	Aug. 25, 1895	Grieg, '98
23	male	Karmö, Norway	Aug. 29, 1895	Grieg, '98
24	female	Annisquam, Mass.	Aug., 1898	Hyatt, '99
25	male	Rugsund, Norway	Nov. 14, 1901	Grieg, :04, :05
26	female	North Long Branch, N. J.	July 22, 1905	

To this list should probably be added the record of a specimen found floating in the sea at the entrance of the British Channel about 1840. The skull of this whale is said to be in the museum at Caen (Flower, '78) and on it Gervais in 1850 founded his *Mesoplodon europæus*. Some confusion has also existed in regard to

¹An incomplete lower jaw in the Museum at Christiania.

²An incomplete cranium without data in St. Petersburg Museum.

³Contained a large fetus.

the dates of certain of the captures. Thus Reinhardt ('80-'81) and Van Beneden ('88) have included examples of *Hyperoödon* in their lists of records; Gray ('66, p. 352) mentions a specimen from Havre, Aug. 22, 1828, and Van Beneden ('88, p. 98) apparently has quoted Gray in including this record in his paper on the Ziphioids of European waters. It is clear, however, from the context that Gray is referring to the specimen described by Dumortier ('39) and taken at Ostend, Aug. 21, 1835. Of this whale, Dumortier relates that it was kept alive out of water for the space of two days but could not be prevailed upon to eat the moistened bread that was offered it! Frequently it gave vent to loud bellowings that resembled the lowing of a cow. Grieg ('98) is able to confirm this testimony as to the possession of a voice by this species, for he states that the female stranded at Karmö in 1895, lowed like a calf that is being slaughtered.

It is clear, then, that *Mesoplodon bidens* is certainly known from the North Atlantic only, between the latitudes of 39° N. (Atlantic City, N. J.) and about 60° N. (Shetland). That it is probably not gregarious has been pointed out by previous writers, and its presence in the colder months at the northern part of its known range has been taken to indicate that it is not migratory, at least in so clear a manner as is the bottle-nosed whale (*Hyperoödon ampullatum*). The fact that so large a proportion of the stranded specimens has been taken on the coasts of islands is indicative of the pelagic habitat of this species as contrasted with certain of the porpoises that often frequent the shallower waters along the coasts.

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